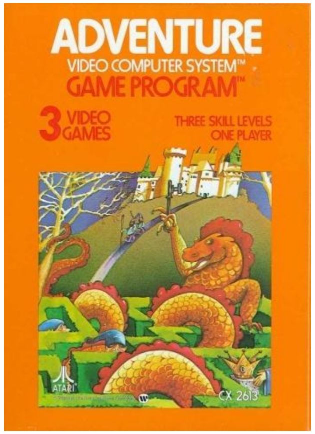
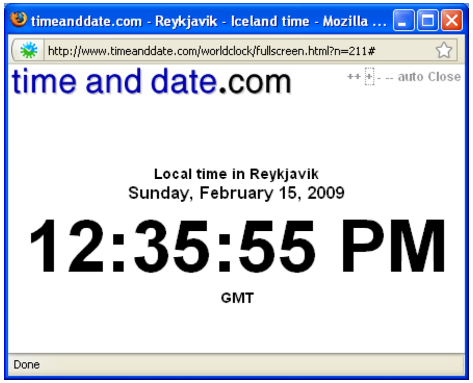



timeanddate.com - Reykjavik - Iceland time - Mozilla ...
http://www.timeanddate.com/worldclock/fullscreen.html?n=211#
time and date.com
++ + - -- auto Close
Done

Local time in Reykjavik
Sunday, February 15, 2009
12:35:55 PM
GMT

Clock Time

GAM0183 Game Programming

Lectures 12, 13, and 14
Temporal Trajectories
and the Day of the Figurines

http://www.dayofthefigurines.co.uk/
http://www.blasttheory.co.uk/bt/work_day_of_figurines.html

see video

Case study:DAY OF THE FIGURINES (DoF)

Source: Flintham, M., Smith, K., Benford, S., Capra, M., Green, J., Greenhalgh, C., Wright, M., Adams, M., Tandavanitj, N., Row Farr, J., and Lindt, I. (2007) Day of the figurines: A slow narrative-driven game for mobile phones using text messaging, in PerGames 2007, 4th International Symposium on Pervasive Gaming Applications, pp 43-52.

Source: Benford, S. and Giannachi, G. (2008) Temporal **trajectories** in shared interactive narratives, in Proceeding of the Twenty-Sixth Annual SIGCHI conference on Human Factors in Computing Systems (CHI 2008), pp 73-82. ©ACM

Introduction

Single player games

- Single player games often provide the player with a lot of control over time and pacing.
  - A game can be paused or saved, then resumed at a later date.
  - Levels of a game can be replayed.
  - Levels of a game can be visited out of order.
    - unless the gameplay dictates successful completion of an earlier level as a prerequisite
  - An undo facility can be used repeatedly to undo actions and reverse time.
  - A game can be slowed down or speeded up.

Introduction

Massively Multiplayer Online Role Playing Games (MMORPGs)

- MMORPGs typically have a more objective approach to time.
- Groups of players share the same timeline that progresses linearly in relation to **clock time**.
- The timeline can advance even when some or all the players are not playing.
- MMORPGs players have very much less control over time and pacing, but they can share a social experience.

Introduction

mobile experiences

- Using portable devices such as mobile phones, games can now be played at any time and anywhere.
  - except during aircraft take-off and landing...
  - except where the mobile network lacks reach...
- Players can fit game playing into the patterns of their daily lives.
  - play while waiting on a bus or train
  - play on the bus or train commute to work
  - play during coffee and lunch breaks
  - play while waiting in a queue to buy lunch

flexible engagement and disengagement

Introduction

using histories of gameplay

- Players may wish to see a full replay or highlights of a game they took part in.
- Players may wish to mix histories of gameplay with their current live experience.
  - for example, racing against a previous version of themselves
    - Gran Turismo

“How can we negotiate the pace and timing of interaction between authors who wish to impose a driving narrative and participants who wish to experience this at times that suit them? “

“Finally, how can participants access recordings of past interactions to create new stories or to weave them in with ongoing ones? “

Steven Benford and Gabriella Giannachi

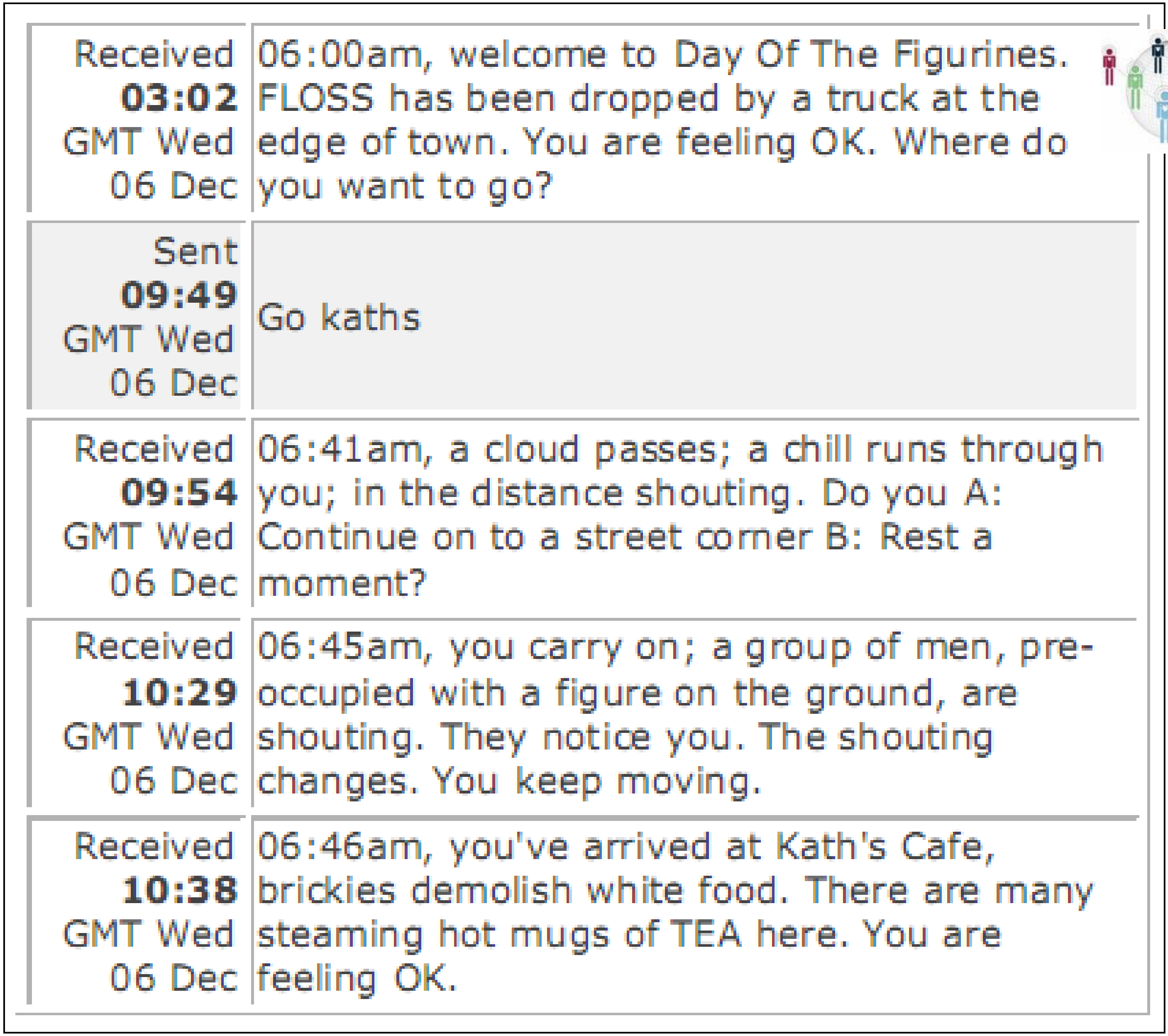
DAY OF THE FIGURINES (DoF)

- Day of the Figurines is a narrative-driven, text messaging game for mobile phones.
- Players were required to send and receive only a few text messages each day as part of a slow game.
- The game is designed to be played by hundreds of players over a month.
- “Players send and receive SMS to control a ‘character’ – their figurine – as it lives through a day in the life of a fictional town, visiting destinations, observing events, using objects, responding to dilemmas, undertaking missions and chatting with others.”
  - there is a mixture of story telling and interactivity

Commands to control a figurine

- GO <destination> – move to the named destination
- SAY <message> – sends this message to nearby players
- FIND <player> – checks whether the named player is at the current destination and if they are moves this player to be within talking distance of them
- PICK <object> – picks up the named object
- DROP – drops the currently held object
- USE – uses the currently held object, triggering its particular effect
- UPDATE – tells the player which other players and objects they can currently see nearby and reminds them of their current health status
- HELP – returns a message directing players where to find online help and also logs a help request in the system for operators to deal with later on
- LEAVE TOWN – quits the game for this player

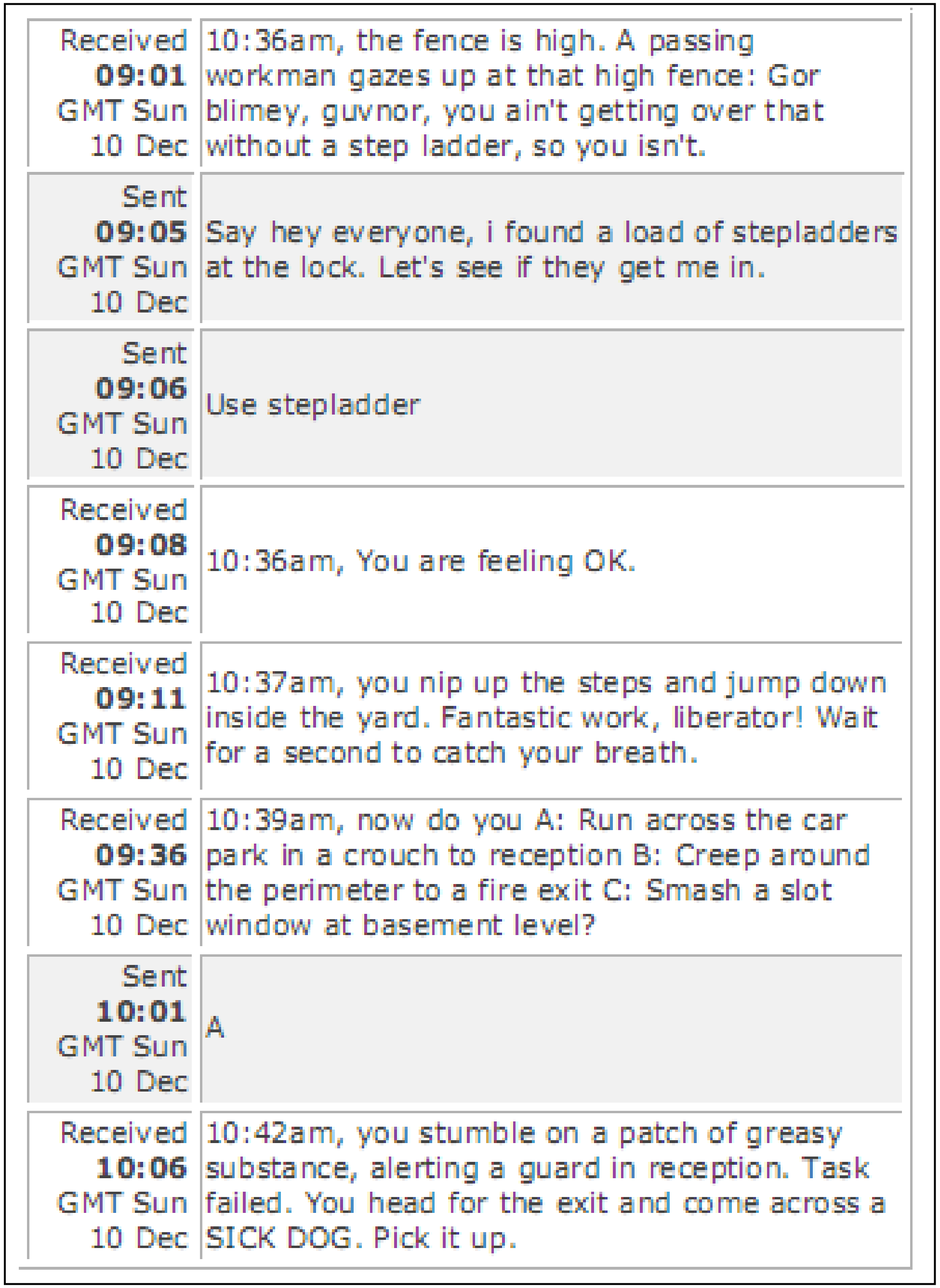
Example interaction:



Received **03:02** GMT Wed 06 Dec	06:00am, welcome to Day Of The Figurines. FLOSS has been dropped by a truck at the edge of town. You are feeling OK. Where do you want to go?
Sent **09:49** GMT Wed 06 Dec	Go kaths
Received **09:54** GMT Wed 06 Dec	06:41am, a cloud passes; a chill runs through you; in the distance shouting. Do you A: Continue on to a street corner B: Rest a moment?
Received **10:29** GMT Wed 06 Dec	06:45am, you carry on; a group of men, pre-occupied with a figure on the ground, are shouting. They notice you. The shouting changes. You keep moving.
Received **10:38** GMT Wed 06 Dec	06:46am, you've arrived at Kath's Cafe, brickies demolish white food. There are many steaming hot mugs of TEA here. You are feeling OK.

dilemma

Example interaction:

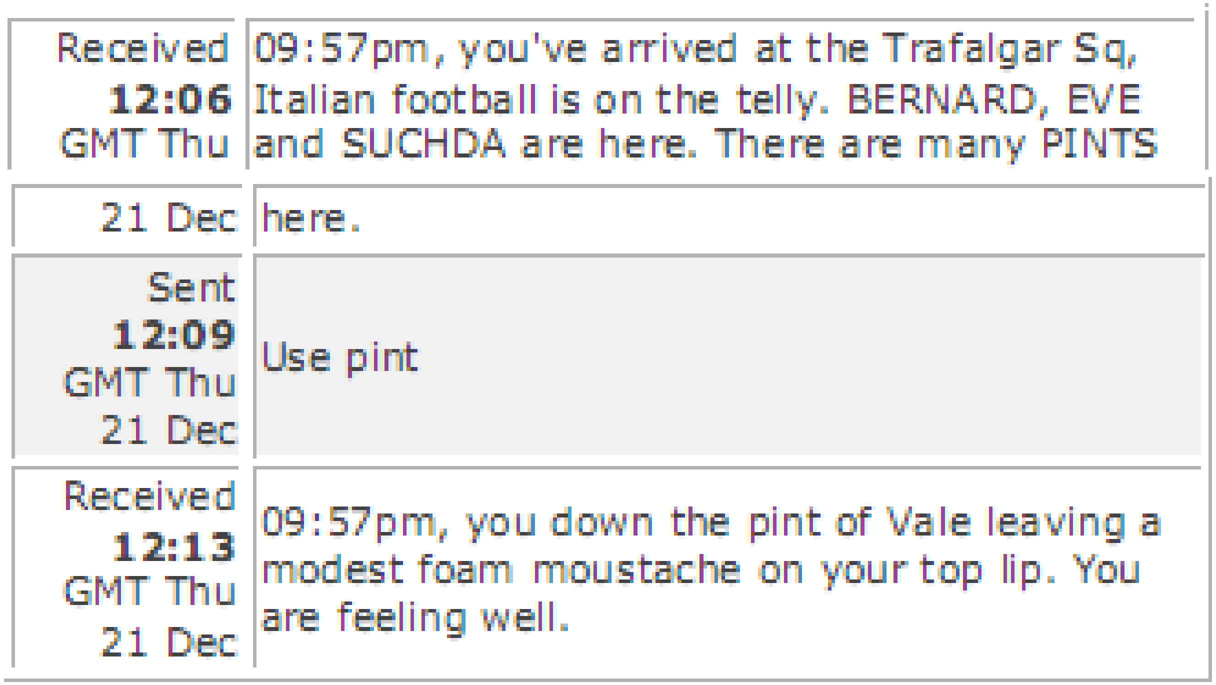


Received **09:01** GMT Sun 10 Dec	10:36am, the fence is high. A passing workman gazes up at that high fence: Gor blimey, guvnor, you ain't getting over that without a step ladder, so you isn't.
Sent **09:05** GMT Sun 10 Dec	Say hey everyone, i found a load of stepladders at the lock. Let's see if they get me in.
Sent **09:06** GMT Sun 10 Dec	Use stepladder
Received **09:08** GMT Sun 10 Dec	10:36am, You are feeling OK.
Received **09:11** GMT Sun 10 Dec	10:37am, you nip up the steps and jump down inside the yard. Fantastic work, liberator! Wait for a second to catch your breath.
Received **09:36** GMT Sun 10 Dec	10:39am, now do you A: Run across the car park in a crouch to reception B: Creep around the perimeter to a fire exit C: Smash a slot window at basement level?
Sent **10:01** GMT Sun 10 Dec	A
Received **10:06** GMT Sun 10 Dec	10:42am, you stumble on a patch of greasy substance, alerting a guard in reception. Task failed. You head for the exit and come across a SICK DOG. Pick it up.

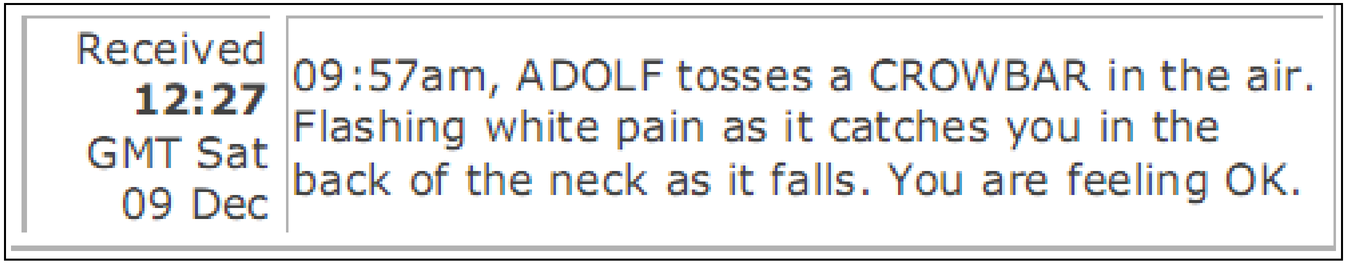
dilemma

failed mission

Example interaction:



Received **12:06** GMT Thu	09:57pm, you've arrived at the Trafalgar Sq, Italian football is on the telly. BERNARD, EVE and SUCHDA are here. There are many PINTS
21 Dec	here.
Sent **12:09** GMT Thu 21 Dec	Use pint
Received **12:13** GMT Thu 21 Dec	09:57pm, you down the pint of Vale leaving a modest foam moustache on your top lip. You are feeling well.



Received **12:27** GMT Sat 09 Dec	09:57am, ADOLF tosses a CROWBAR in the air. Flashing white pain as it catches you in the back of the neck as it falls. You are feeling OK.

DAY OF THE FIGURINES (DoF)

- DoF was designed to be a slow game so that playing the game could be interwoven with players´ daily activities such as commuting to work by bus or train.
- The game´s objective is deliberately ambiguous. “There is no explicit winning or losing.” Players are told to help other players and that the rules of the virtual city have to be discovered.
- The back story is that players are refugees who have just arrived at a town. They must learn to survive. Players can become more or less healthy and players can die if they become too unhealthy or if hit repeatedly by a weapon.
- DoF was iteratively developed over 2 years and has a unique treatment of narrative and time.

DAY OF THE FIGURINES (DoF)

- Game elements have a temporal scope that constrains when they become available to a player.
- The game assumes a default answer or action if a player does not provide one “to keep the narrative moving on”.
  - A player´s character remains ‘active’ even if their phone is switched off.
- 24 hours of time in the narrative are played out over 24 days of the players´real lives.
- Game time is shared and unfolds linearly in relation to actual time “no matter how much or little each individual plays”.

DAY OF THE FIGURINES (DoF)

- When a phone is switched back on, the player receives text messages about missed events.
  - some DoF players have expressed irritation by the flood of messages after switching their phones back on
  - occasionally DoF players have switched on their phones only to find out they have been killed by other players who ‘hit’ them repeatedly with a weapon.
    - Bill of Player´s Rights #1 Not To Be Killed Without Warning
- DoF is delivered as a touring artistic performance. Each performance runs for 24 days for 10 hours a day.

DAY OF THE FIGURINES (DoF)

- Some DoF players found it difficult to maintain social relationships with other players.
  - Delivery of text messages were sometimes delayed for hours as a result of network congestion or phones being switched off.
  - Some players were in different world time-zones and so were asleep while other players were awake.
  - Some players played sporadically, sometimes not playing for several days.
    - Players´ patterns of engagement varied widely.

DAY OF THE FIGURINES (DoF)

- Some DoF players have said that they would like to be able to take a pause and then resume the game later.
- Some DoF players have reported enjoying reviewing their personal histories to either plan what to do next or simply for the pleasure of reflection.
  - Players´ phones often lacked sufficient storage to view a complete history.
  - Players could view a complete history on the web, but only after a performance had finished.
- Some DoF players expressed a desire to be able to compare their personal histories with others.

The physical game board

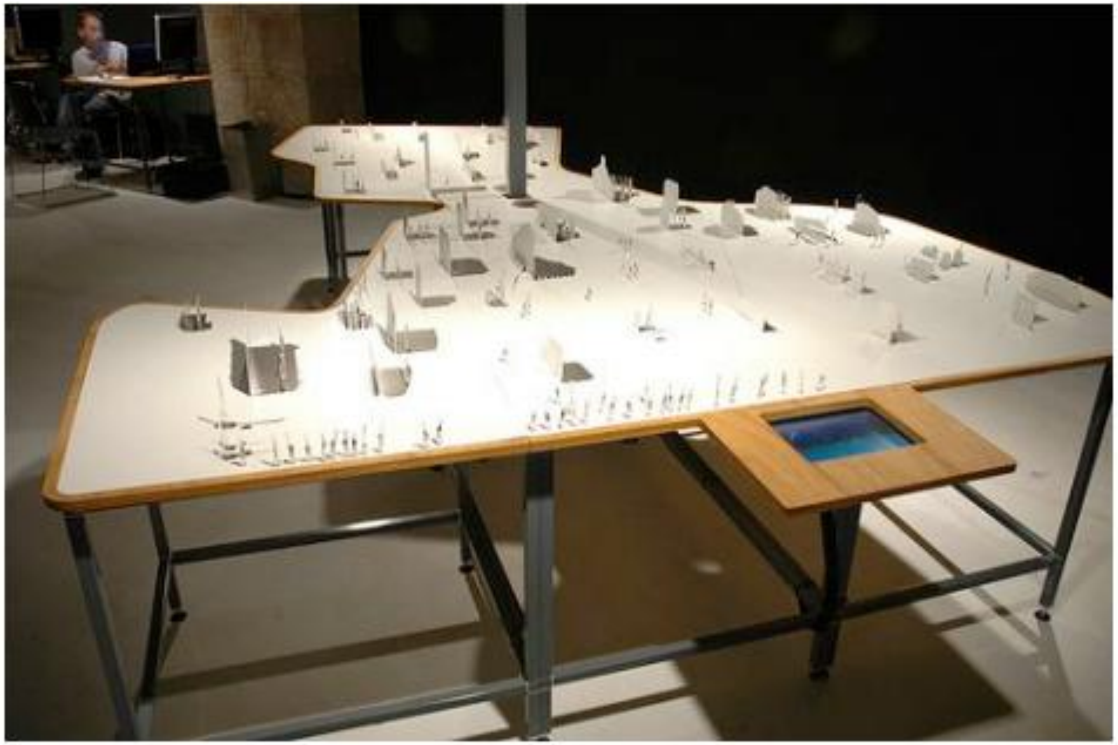


Figure 3: The Board and Spectator Interface

- A physical game board shows the destinations within the town and the positions of figurines that are playing at any moment in time.
- Players have to visit the physical game board to register.
- The physical game board helps players visualise the town.

Story Time (ST)

- Story time is determined by the author.
- Story time is the fictional time in the story universe.
  - In DoF, storytime is a period of 24 fictional hours.
- Story time refers to the order of the underlying events in the story universe.
- An important characteristic of story time is the historic epoch in which the story is set.
  - ancient, medieval, contemporary, futuristic?
    - players expect certain practises and customs depending on a game´s epoch

How much actual knowledge of a particular epoch do you expect a player to have?

Epoch: ancient European history

http://en.wikipedia.org/wiki/Ancient_history downloaded 3/10/09

"The term classical antiquity is often used to refer to ancient history since the beginning of recorded Greek history in about 776 BC (First Olympiad). This coincides, roughly, with the traditional date of the founding of Rome in 753 BC, the beginning of the history of ancient Rome. Although the ending date of ancient history is disputed, Western scholars use the fall of the Western Roman Empire in AD 476,[10][11] or the death of the emperor Justinian I,[12] or the coming of Islam[13] and the rise of Charlemagne[14] as the end of ancient European history."

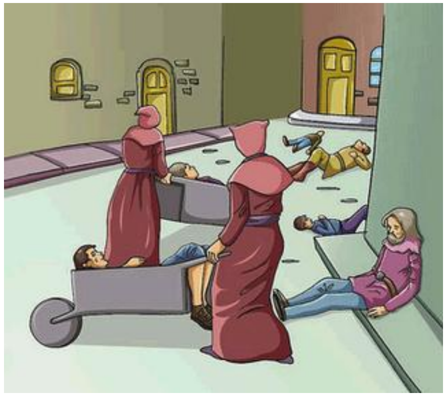
If the story is set in classical antiquity, a player might expect to meet a centurion.

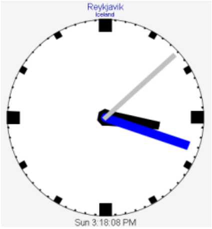
Epoch: Middle Ages

http://en.wikipedia.org/wiki/Medieval downloaded 3/10/09

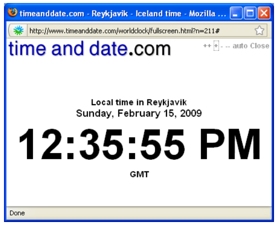
"The **Middle Ages** of European history (adjective form **medieval** or **mediæval**) was a period in history which lasted for roughly a millennium, commonly dated from the fall of the Western Roman Empire in the 5th century to the beginning of the Early Modern Period in the 16th century, marked by the division of Western Christianity in the Reformation, the rise of humanism in the Italian Renaissance, and the beginnings of European overseas expansion.

If the story is set in the Middle Ages, a player might expect to meet people dying from the plague (the Black Death).





Clock Time (CT)


timeanddate.com - Reykjavik - Iceland time - Mozilla ...
http://www.timeanddate.com/worldclock/fullscreen.html?n=211#
time and date.com
++ + - -- auto Close
Done

Local time in Reykjavik
Sunday, February 15, 2009
12:35:55 PM
GMT

- Clock time is the time as measured by a clock in the real world.
- Clock time is not the same as the time experienced by a player. If a player enters an ´flow state´, time can be experienced as having passed more quickly than clock time.
  - **‘Scientists prove time flies when you're busy’**
- A player who is bored by the gameplay might even experience time as passing more slowly than clock time.
- Natural body rhythms can influence how players experience time.

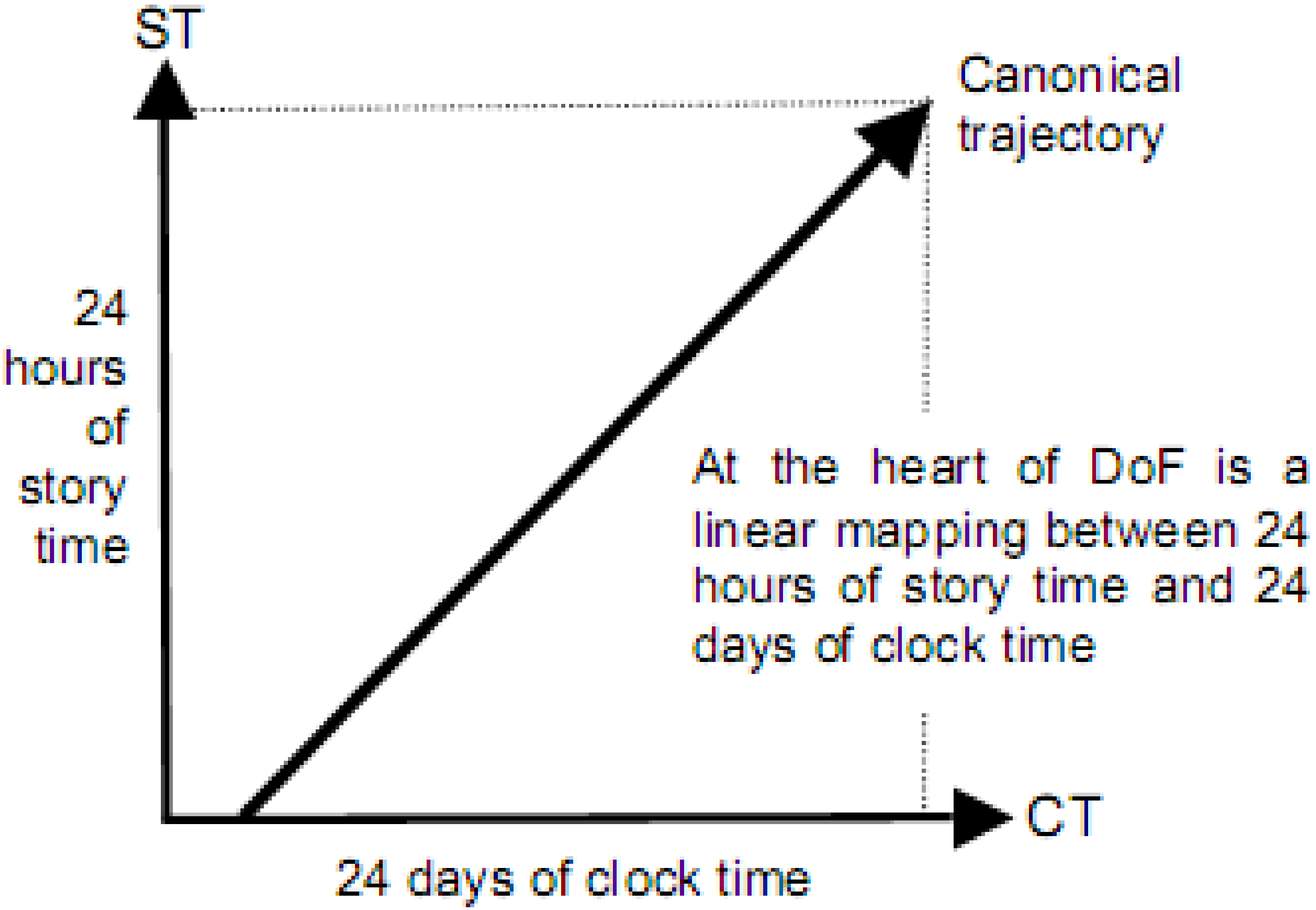
result time and **set time**

- Some games are played until someone wins: the result time.
- Some games are played for a fixed period of time, a set time.
  - A performance of DoF is played for a set time
    - 10 hours a day for 24 days.

Canonical Trajectory

- A canonical trajectory is a mapping between story time and clock time.
- A canonical trajectory expresses the author´s intent for the temporal structure of the game.
- Players will usually follow the canonical trajectory.
- Players, however, can diverge from the canonical trajectory through disengagement, or simply because of network delays and network disconnections.

Figure 1: the core canonical trajectory underlying DoF ©ACM

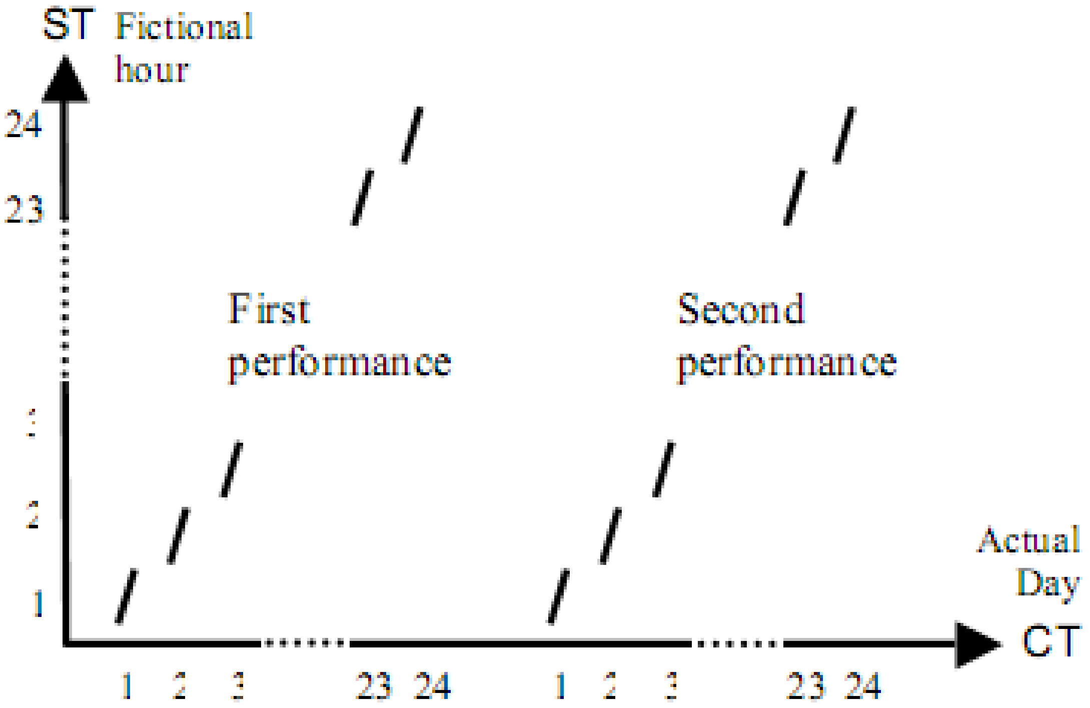

ST
Canonical trajectory
24 hours of story time
At the heart of DoF is a linear mapping between 24 hours of story time and 24 days of clock time
CT
24 days of clock time

simplified view of DoF

Canonical Trajectory

- Clock time always moves forwards as we cannot time travel in the real world.
- Time travel may be possible in a story universe, so the trajectory could jump up and down the vertical axis.
- If a player has control over the pace of a game, then story time might speed up or slow down relative to clock time.
  - the gradient of the line would change
- Story time could progress vertically downwards if the story unfolds in reverse as clock time advances.
- Canonical trajectories might also include branching narrative structures dependent on interactive decisions.

Figure 2: Canonical trajectories express scheduling ©ACM



DoF

- Canonical trajectories also express **schedule time**.
  - when can players play?
- 1 hour of story time unfolds over 10 hours of a particular day.
- Each performance of DoF has its own canonical trajectory.

MMORPGs

- Virtual worlds often provide for social interaction with time unfolding linearly in relation to clock time.
- Multiple canonical trajectories can represent complex temporal structure.
  - Quests shared by groups of players have their own localized canonical trajectories for a limited duration of clock time.

Quest: “Something the player is trying to accomplish. A somewhat broader term than puzzle, the term quest usually implies something with significance at the narrative level.”

http://www.ifwiki.org/index.php/Quest_(term)

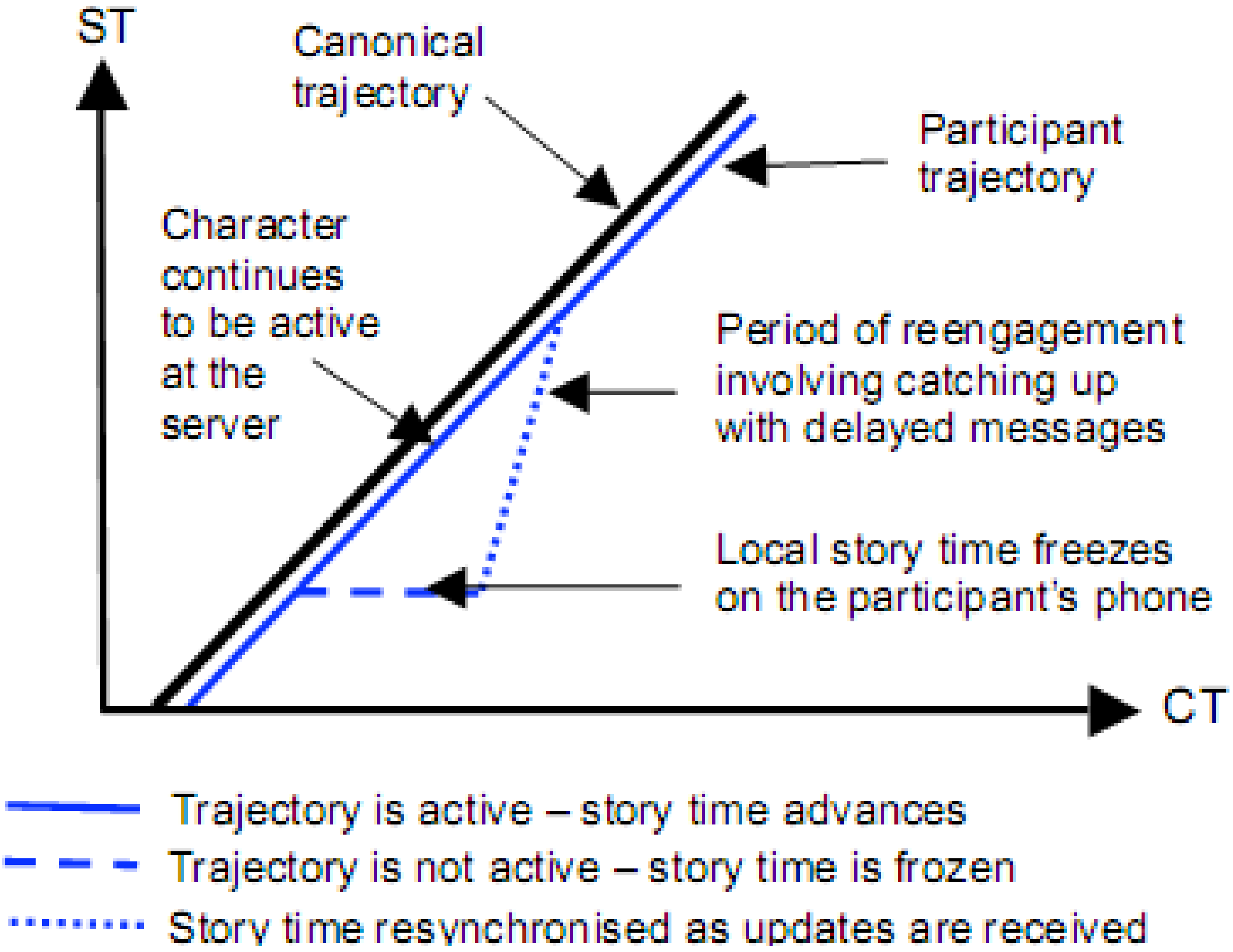
Participant Trajectory

- Each player follows a participant trajectory.
- While a canonical trajectory describes where the game author wants a player to go, a participant trajectory describes where a player actually is in story time as clock time unfolds.
- Participant trajectories represent **interaction time**.

DAY OF THE FIGURINES (DoF)

- When disconnected from the game server, story time appears frozen to the player.
  - network disconnection, mobile phone switched off
- The game server, however, continues to operate the player´s character so that “others can still see it, speak to it, and use objects on it, although it will not respond.”
  - This explains why some DoF players sometimes felt ignored by others.

Figure 3: Disengagement and reengagement in DoF ©ACM

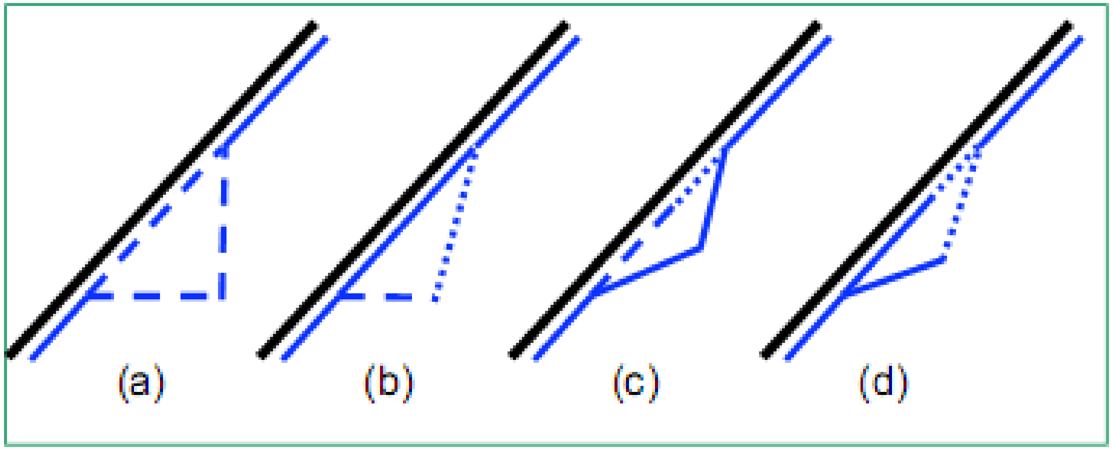

ST
Canonical trajectory
Participant trajectory
Character continues to be active at the server
Period of reengagement involving catching up with delayed messages
Local story time freezes on the participant's phone
CT
Trajectory is active – story time advances
Trajectory is not active – story time is frozen
Story time resynchronised as updates are received

DAY OF THE FIGURINES (DoF)

- During the period of reengagement, there is inconsistency between the player´s notion of story time and that of the game server (and so other players.)
- If the period of reengagement has a steep trajectory, a player´s phone might be flooded with messages.
- If the period of reengagement has a shallow trajectory, the player might try to respond to a message as if they were actually at an earlier point in story, which can result in confusion.

Figure 4: four 'routes' round the 'Bermuda triangle'

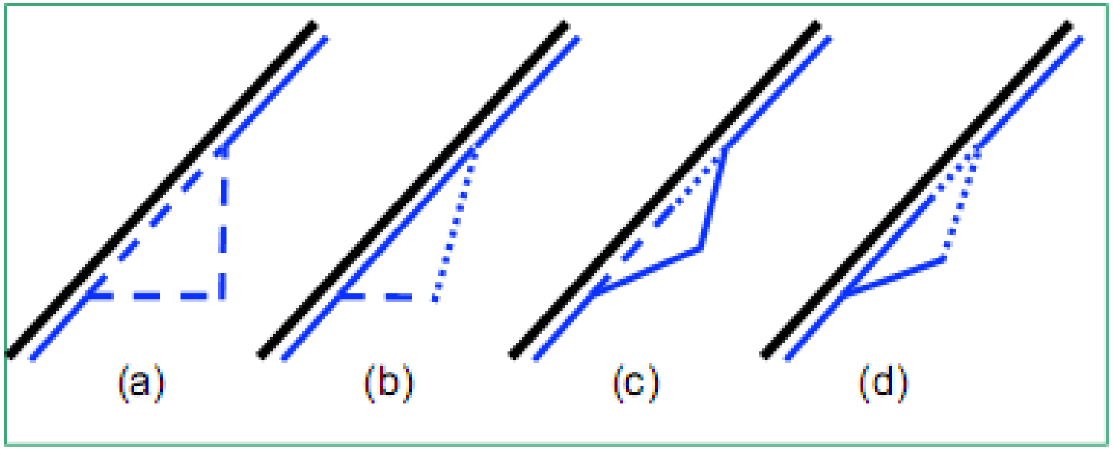
(a)



- The player is removed from the game for the duration of the disengagement.
- There are no update messages.
- There are no nasty surprises like players being informed they are dead.
- Disengaged players, however, miss a chunk of the narrative.
- "This approach is typical of MMORPGs such as World of Warcraft."

Figure 4: four ‘routes’ round the ‘Bermuda triangle’

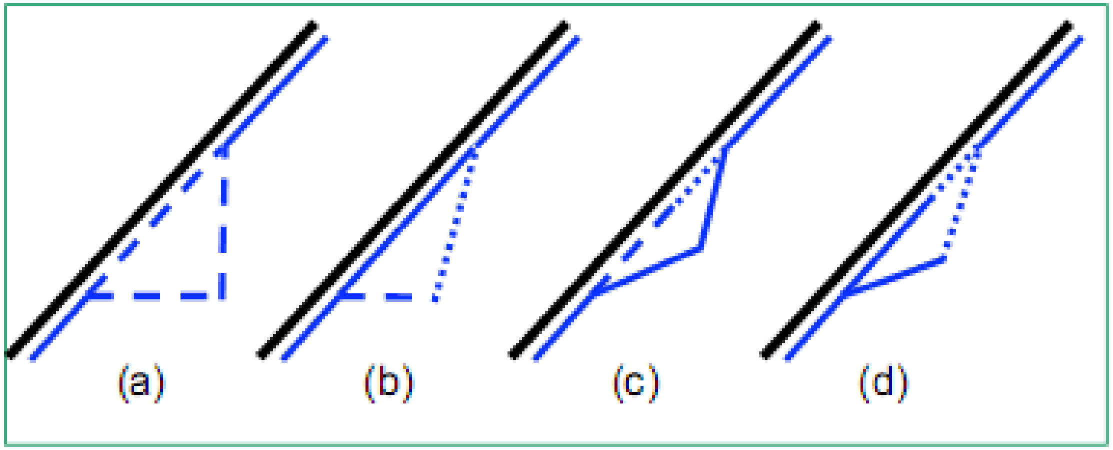
(b)



- (b) is the situation in DoF.
- During the period of reengagement, the player receives update messages.
- There might be nasty surprises like players being informed they are dead.

Figure 4: four ‘routes’ round the ‘Bermuda triangle’

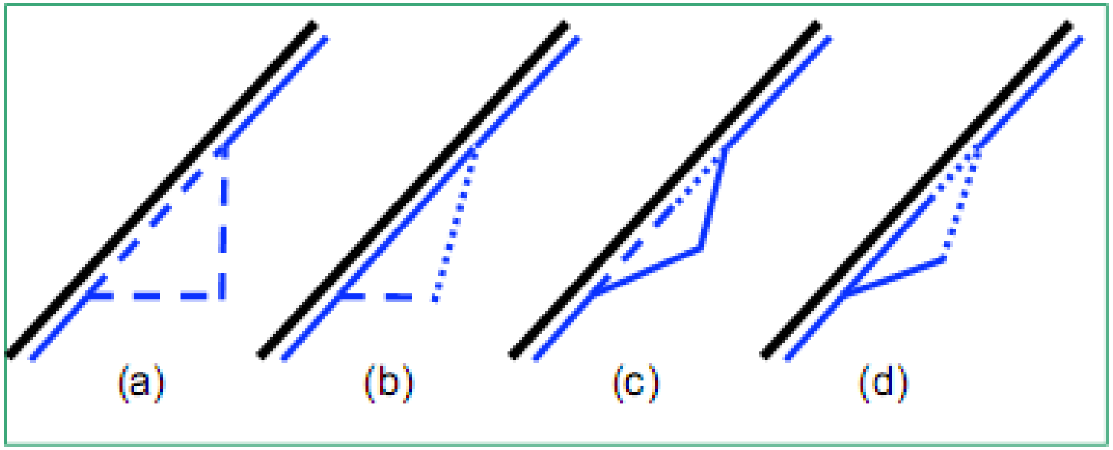
(c)



- The player is removed from the game for the duration of the disengagement.
- The player, however, continues to interact with a local version of the game.
  - The local device must be capable of running the game independently.
- During the period of reengagement, the two story times are resynchronised.

Figure 4: four ‘routes’ round the ‘Bermuda triangle’

(d)



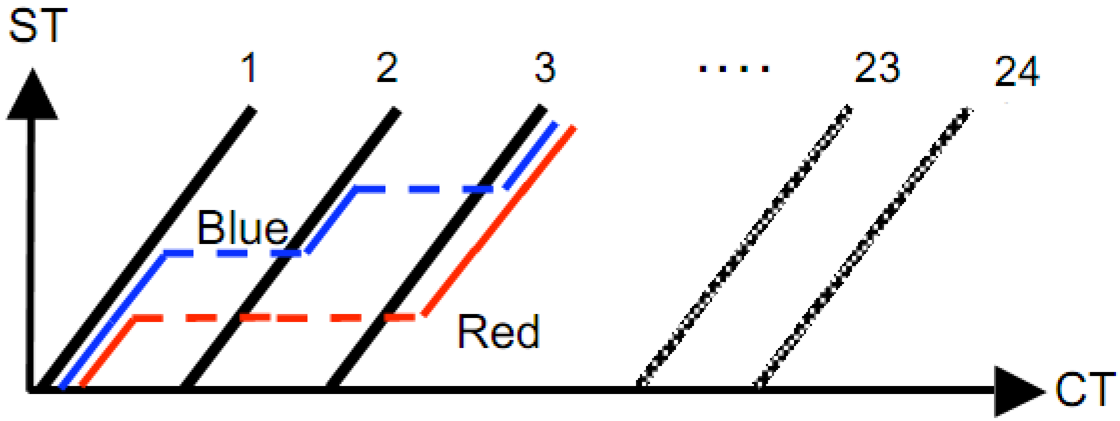
- The game server maintains a version of the player´s character.
- The player, however, continues to interact with a local version of the game.
- During the period of reengagement, the two story times are resynchronised, but there is a “considerable risk of inconsistency”.

Historic Trajectory

- With records of player interactions, different historic views of what happened can be synthesised. A historic trajectory defines one particular view of history.
- A historic trajectory involves a selection of segments from participant trajectories.
- A historic trajectory might be presented using a different medium.
- Selected segments might be presented in an order different to which they occurred.

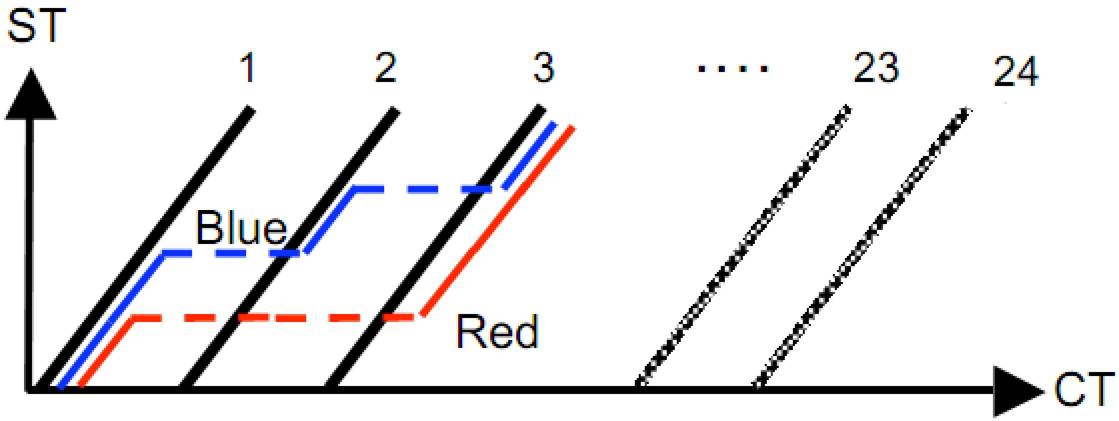
Using temporal trajectories to envisage new possibilities for time and interaction.

Figure 5: A rolling experience with variable pacing ©ACM



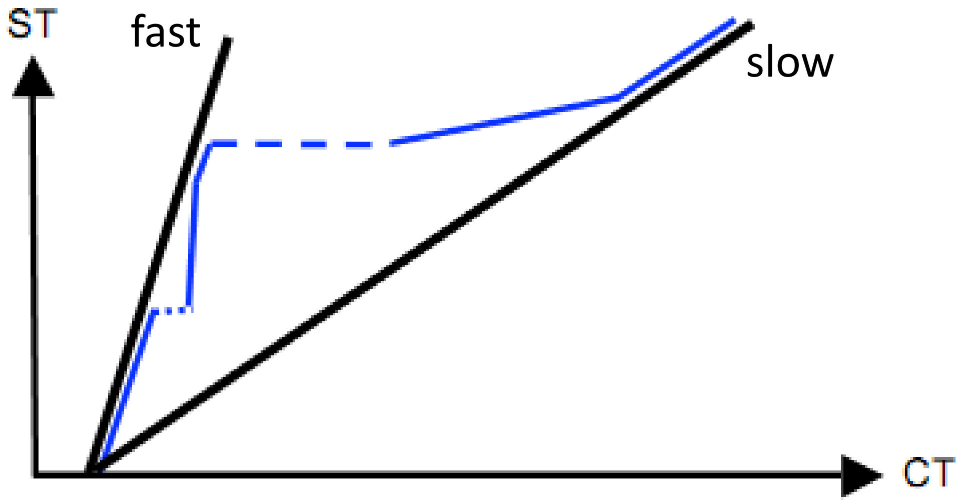
- A new performance of DoF is launched each day.
- Use a simple pacing rule: any day in CT during which a participant sends a message to the game is deemed to be an 'engaged day', causing ST to advance by one hour; whereas any day when they do not send a message is deemed to be a 'disengaged day' during which ST does not advance.

Figure 5: A rolling experience with variable pacing ©ACM



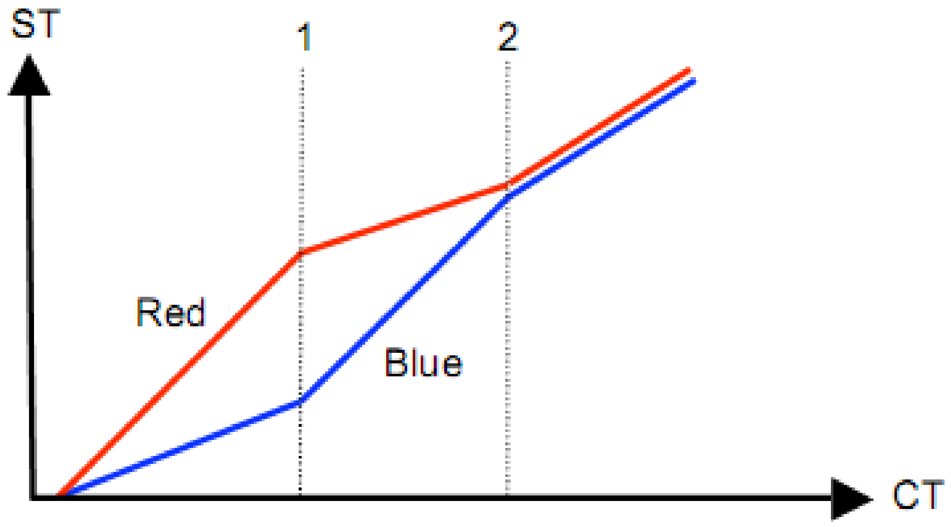
- A player who sends a message every day will complete the game in 24 days. Slower paced players will take longer and the required 24 hours of play is no longer contiguous.
- Slower paced players (Blue, Red) are likely to encounter different groups of players and different game states as they pass through different performances of the game.
- Maintaining friendships might be difficult for two players unless they play at the same pace.

Figure 6: Using multiple canonical trajectories to group participants according to their pace of interaction. ©ACM



- The blue player is initially assigned to the fast-paced canonical trajectory.
- The blue player is resynchronised with the fast-paced canonical trajectory after a brief period of disengagement.
- After a longer period of disengagement, the blue player is resynchronised with the slower-paced canonical trajectory.
- Players are dynamically divided into differently paced groups.

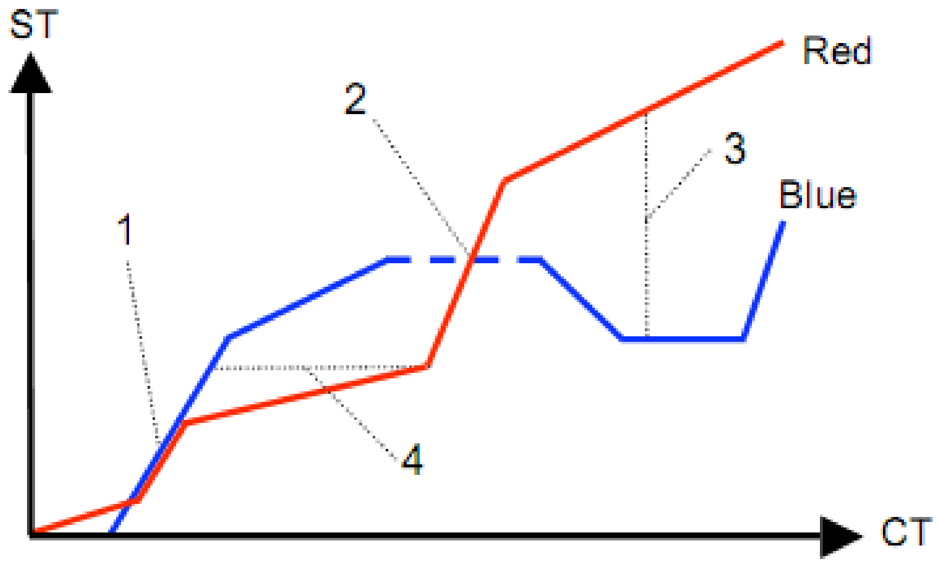
Figure 7: synchronising two participant trajectories. ©ACM



- Initially, Red and Blue have different participant trajectories.
- At clock time 1, the game server slowly steers Red and Blue together by speeding up the rate at which Blue consumes story time, and slowing down Red.
- At clock time 2, the trajectories are held together allowing Blue and Red to share the narrative.

Figure 8: different kinds of encounters in time. ©ACM

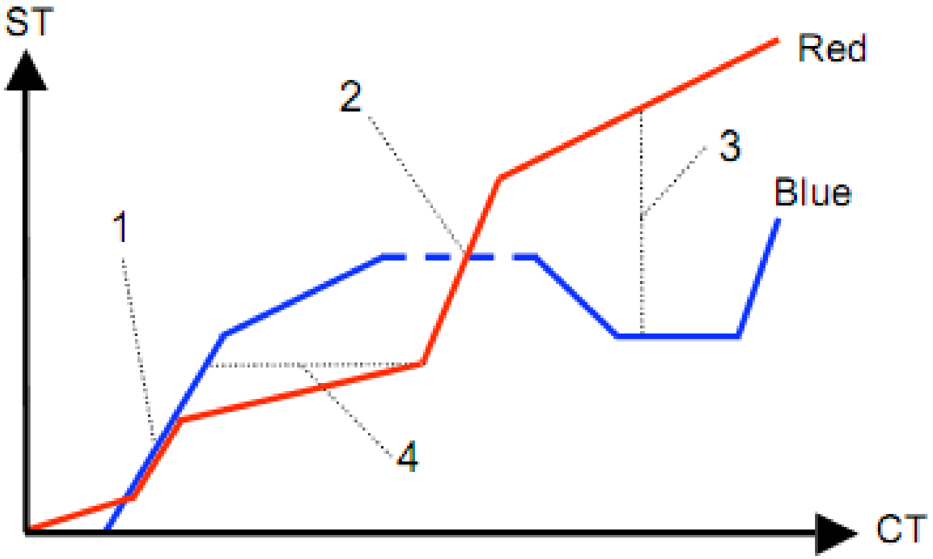
(1)



- Blue and Red have a common, temporal trajectory.
- Blue and Red can share an interactive narrative.

Figure 8: different kinds of encounters in time. ©ACM

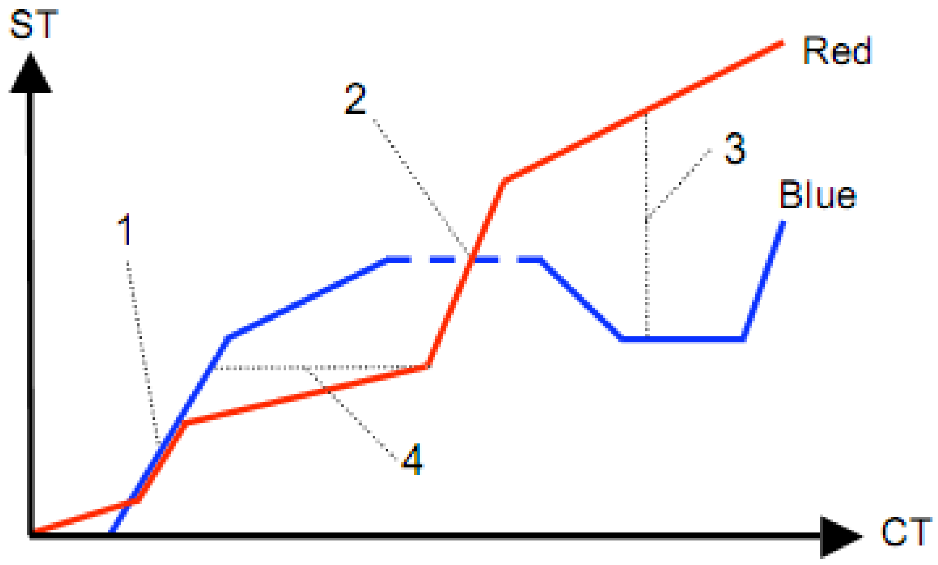
(2)



- The Blue player is disengaged.
- The Red player could be allowed to interact with Blue´s character if it is maintained by the game server.
- If Blue´s character is passive rather than active, the Red player might think “Blue is ignoring me”.
  - Using AI techniques, it would be possible to allow a character to be intelligently active.
- If Blue´s character is killed, the Blue player has a nasty surprise after reengagement.

Figure 8: different kinds of encounters in time. ©ACM

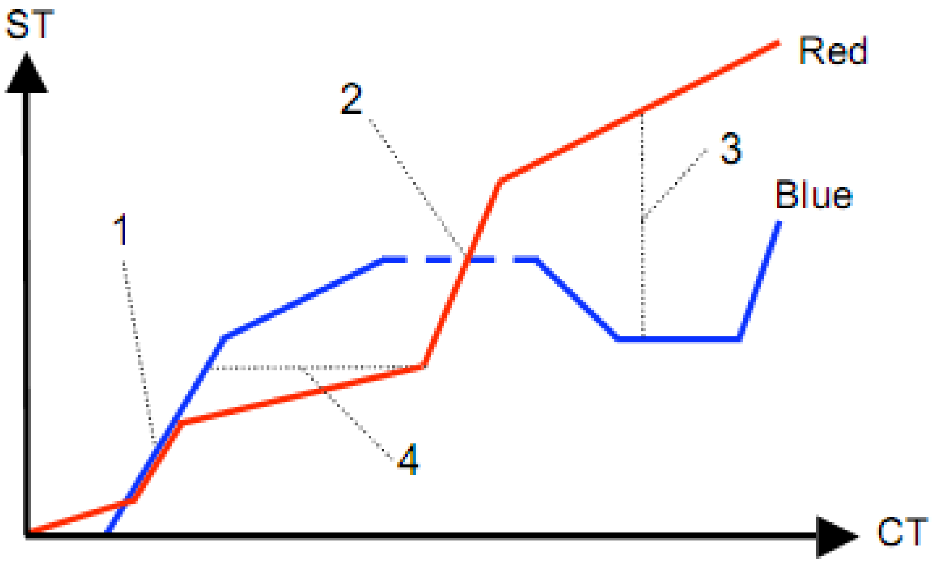
(3)



- Blue and Red are at the same clock time, but Blue and Red are at quite different story times. What would an encounter mean if Blue and Red are in the same room but at different story times?
- One new narrative possibility is to allow a player to use a ‘time portal’ to allow them to discover information about the future or to leave a message for those in the past.

Figure 8: different kinds of encounters in time. ©ACM

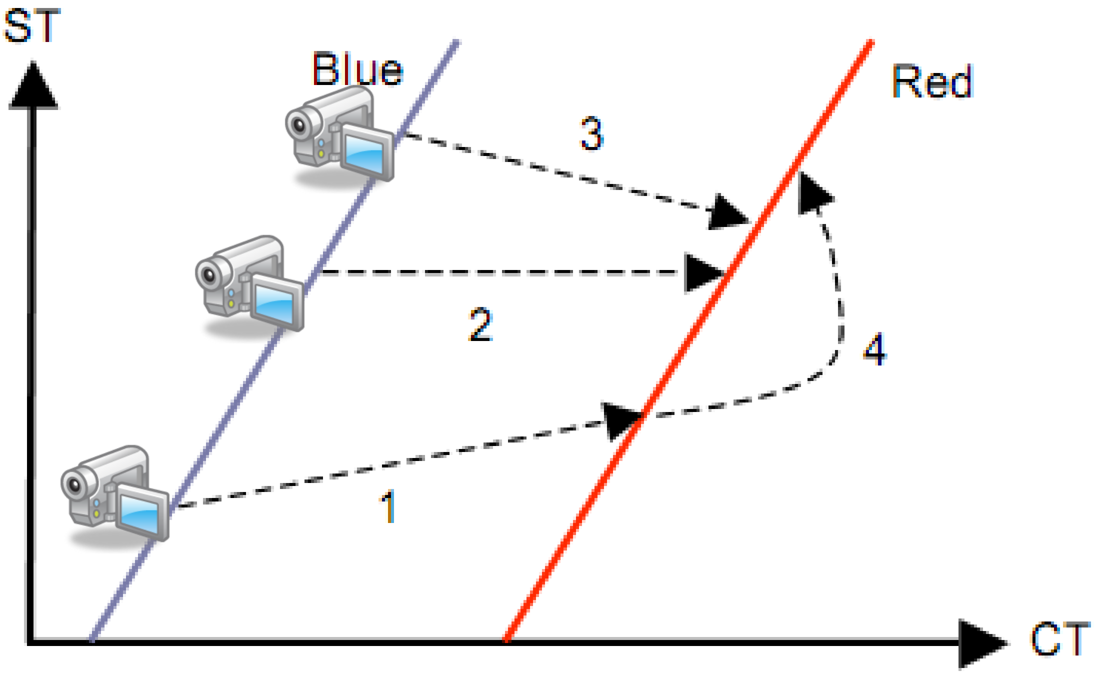
(4)



- Blue and Red are at the same story time, but different clock times.
- Communication between players is asynchronous.
- Blue might see a message from Red or a recording of what Red did.

Figure 9: accessing recorded events from the past. ©ACM

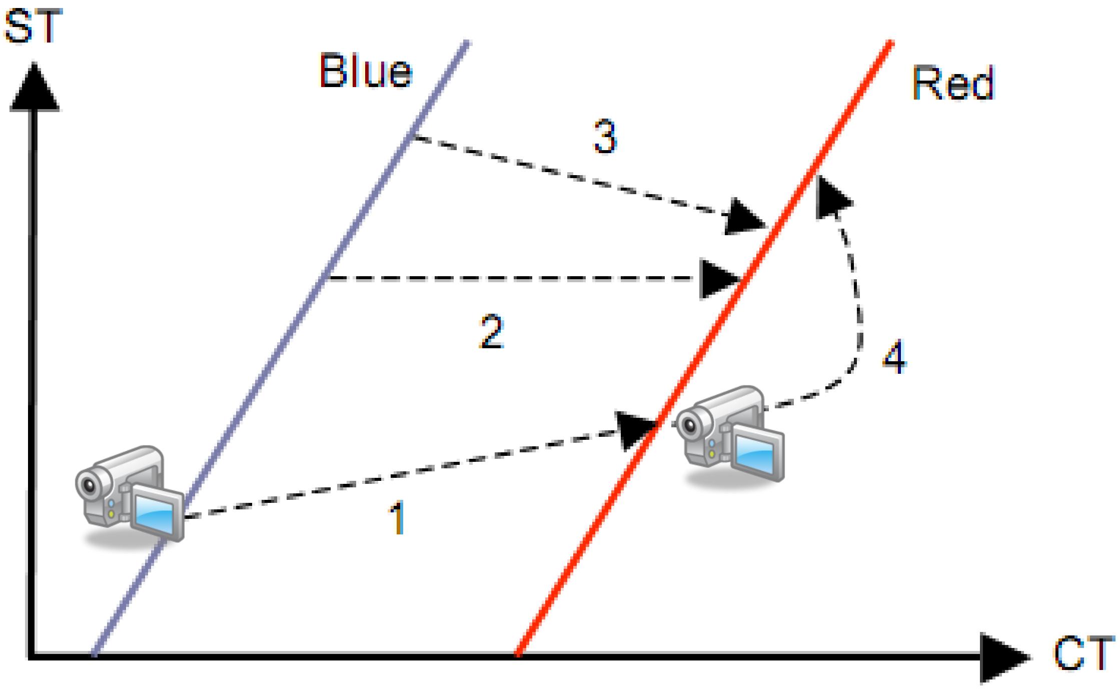
(1,2,3)



- Red views events recorded by Blue at past (1), present (2), and future (3) story times respectively.

Figure 9: accessing recorded events from the past. ©ACM

(4)

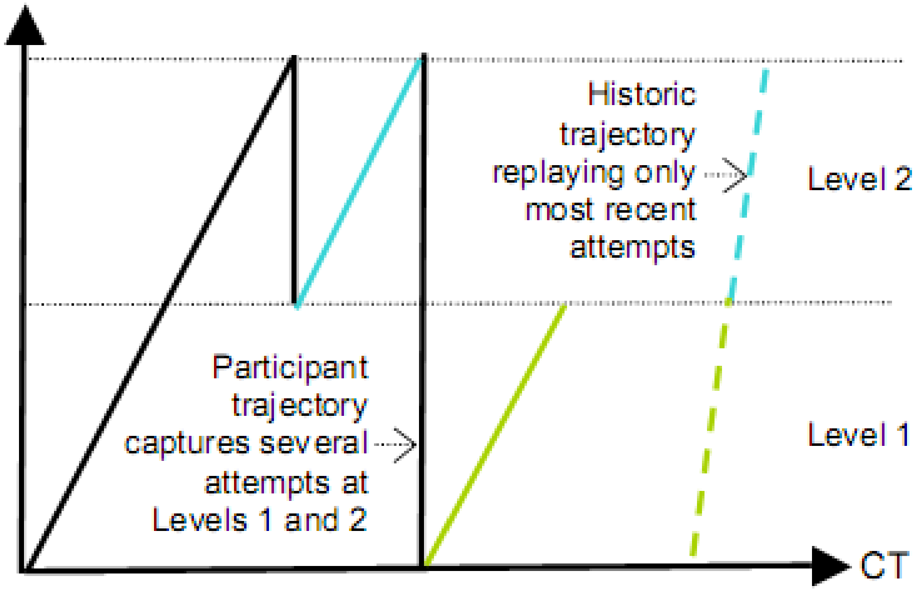


- At some time in the future, Red views a recording of themselves viewing the recorded event by Blue (1).

Recorded events

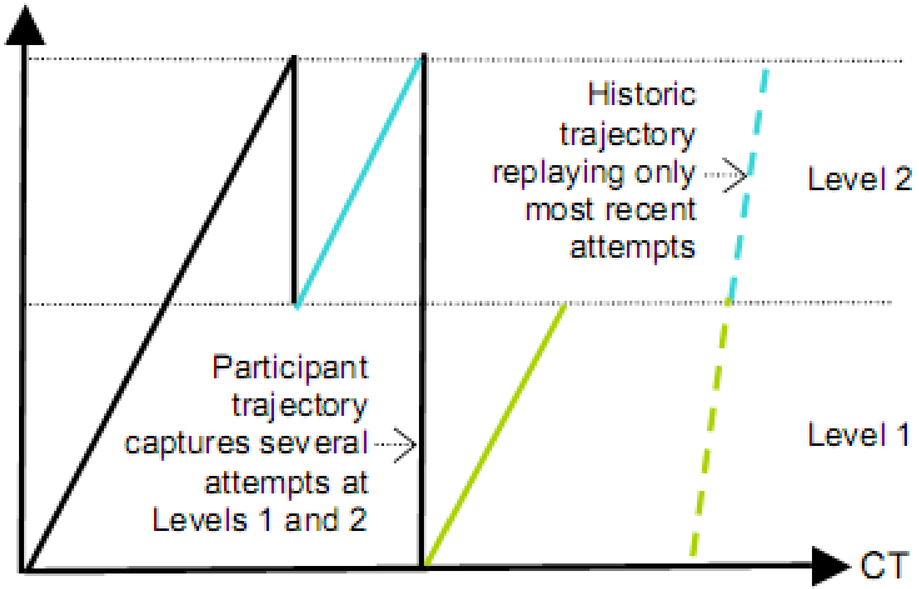
- Recorded events are immutable.
- With a mixture of live and recorded events, players can interact with only some elements while viewing the rest.

Figure 10: synthesising a historic trajectory ©ACM


Historic trajectory replaying only most recent attempts
Level 2
Participant trajectory captures several attempts at Levels 1 and 2
Level 1
CT

- Game levels 1 and 2 are played twice.
- The historic trajectory combines the most recent attempts.
- The historic trajectory is viewed at a faster pace.
  - steeper slope

Figure 10: synthesising a historic trajectory ©ACM


Historic trajectory replaying only most recent attempts
Level 2
Participant trajectory captures several attempts at Levels 1 and 2
Level 1
CT

- Synthesising a historic trajectory must be done with care to avoid anomalies such as the cast of other players suddenly changing.
- Natural breaks in the structure of story time can be exploited to avoid anomalies.

Conclusions

Steven Benford and Gabriella Giannachi

- Temporal trajectories express the complex mappings of story time with clock time in shared, interactive narratives.
- Temporal trajectories enable ´diagrammatic reasoning’ about temporal issues.
- “Games and other forms of entertainment may benefit from more relaxed notions of synchronization and pacing as well as new approaches to mixing recorded and live action. “
- “... we wish to extend temporal trajectories towards a more comprehensive account of time in interactive experiences.”
- “... we need to develop an account of the relationship between interaction time and perceived time.”